

# **SOP for Themes, Attribute Tables, and Map Design**

## for Colonial NHP, NPS

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## Overview

*This standard operating system (SOP) is based on the use of Arc View 3. These SOP's are the minimum requirements for all preparation and use of GIS themes (spatial data, shapefiles, \*.shp) and associated tables (databases, attributes, \*.dbf) at Colonial NHP. The areas covered below include:*

- ◆ Developing a new shapefile theme and attribute table
- ◆ Harddisk subdirectory setup
- ◆ Subdirectory and shapefile names
- ◆ Minimum attribute fields for shapefiles tables
- ◆ Use of Feature and Name fields in attribute tables
- ◆ GIS data source type field (*a quick metadata reference*)
- ◆ Data dictionary for attribute files (*in development and updating*)
- ◆ Map design – color, symbols, size (*being updated*)
- ◆ GIS project request form
- ◆ Contract specifications for GIS projects

**Theme Development Steps** – *if you are planning for a new GIS theme and table, e.g., Colonial period plots of the Village of Yorktown, parkwide sign inventory etc. you should follow the below guidelines to insure success and compatibility with the park's GIS.*

1. Coordinate development of new GIS themes/tables with the park GIS coordinator.
2. What theme/table do you need?
3. Do you need just the spatial information? Or do you need attributes also in a table format?
4. Does the theme need to be a polygon, line, point feature or combination? See below map.
5. Is the data:
  - 5.1. Available as a derived product from the park GIS?
  - 5.2. Can it be digitized using the park's digital aerial imagery?
  - 5.3. Available in digital vector format from another source?
  - 5.4. Available as a map, scaled drawing etc. that can be digitized and georeferenced?
  - 5.5. Available as a text or database file with geographic X, Y coordinates (UTM, State Plane, Latitude/Longitude) that can be entered directly into GIS format?
6. What are the scale, resolution and area of coverage<sup>1</sup> needed?
7. Can it be GPS'd<sup>2</sup> in?
8. Is GPSing needed to register paper maps, drawings etc.?
9. Once the source material is located you will need to:

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<sup>1</sup> Scale – 1:1200, 1:24000; Resolution – 1 pixel equals 1 ft; Area – Jamestown Island, Yorktown VC parking lot.

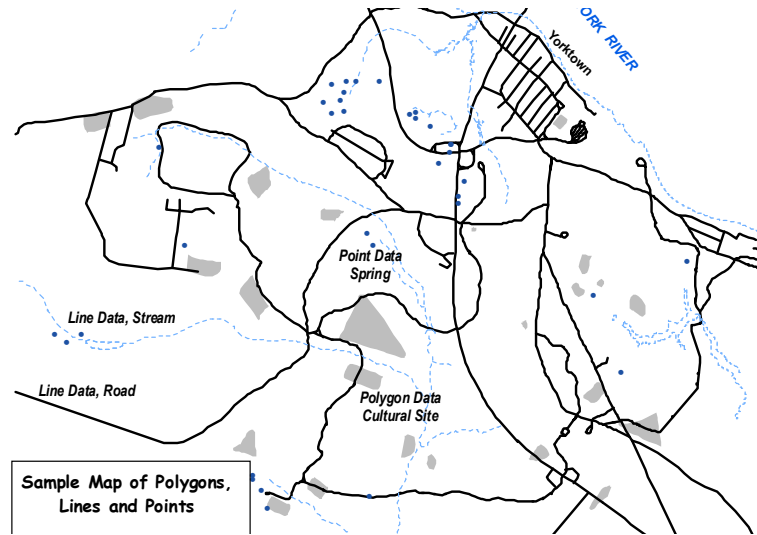
<sup>2</sup> GPS, global positioning system satellite system using park owned GPS hardware and software.

- 9.1. The design of the attribute table should meet park/division needs. Is there already a database that you want to link or join to the spatial data, e.g., ANCS? If not what do you want to be able to do with the database, e.g., schedule annual maintenance of all park signs, calculate acres of Class A lawns?
- 9.2. Prepare a data dictionary for the attribute table.
- 9.3. Prepare guidelines for digitizing the spatial data and attribute data entry.
- 9.4. Collect the attribute data for entry into the table (database).
- 9.5. To estimate the time and cost of digitizing a map by NCSU, count the number of points, lines and regions. You can save time by counting by five to average the total number of points, lines, and regions.
  - 9.5.1. Digitizing Time - Point = 1 min w/ checkplot, Line = 2.5 min/point w/ checkplot, Polygon = 5 min/point w/ checkplot
  - 9.5.2. \$10/hr for graduate student, \$14/hr for research associate, plus 15% benefits
  - 9.5.3. Overhead should be figured at 30% of cooperative agreement for NCSU in-kind contribution
10. Determine when the product is needed,
  - 10.1. Can be done in-house or,
  - 10.2. Will it need to be sent out to North Carolina State University, James Madison University or a contractor?
11. Digitize theme and input attribute data.
12. Complete digitizing form and calculate RMS value (see form below).
13. Use the park's 1:2400 or better digital aerial imagery to check new theme.
14. Field (ground) verify the new theme and data.
15. Have final theme and attributes checked by a second individual.
16. Complete metadata. *You should start collecting the data back in item 9.* See the metadata section below (*under construction*). Data can be entered as a text file or in the Metamaker II software.
17. Have final spatial and attribute database reviewed by GIS coordinator and specialist.
18. Distribute to users<sup>3</sup>, except for sensitive information. Sensitive information can only be released with the appropriate approval, e.g., natural or cultural resource specialist.
19. Do you want the data added to the NPS, Spatial Data Server for downloading from the World Wide Web?
20. Do you need the final product on CD, diskette, zip drive?

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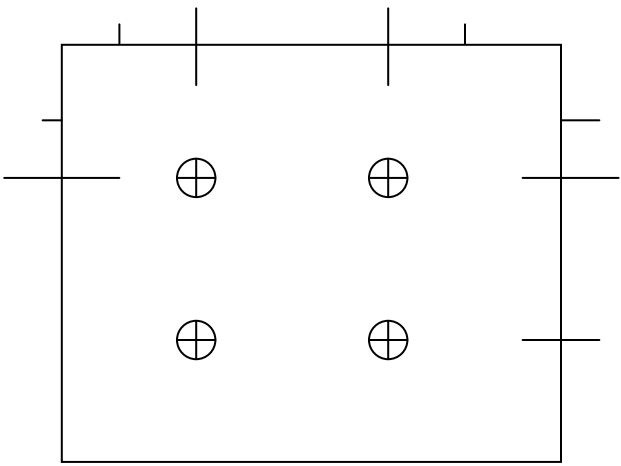
<sup>3</sup> Possible distribution list includes COLO HIP and Maintenance, NCSU-FTSC and NSDI, county\city cooperators, CW-DAR, WM-CAR, JMU-GIS, CBPO-GIS, Phil SO.

## Map Example of Polygons, Lines, Points



## Example of Table

SHAPE	AREA	PERIMETER	FEATURE_1	FEATURE_2	FEATURE_3	NAME	STYPE	METADATA	IMAGE
Polygon	220.49615	144.97329	Hydrology	Stream	Perennial	Beaver Dam	ASC1		
Polygon	642.46865	296.32844	Hydrology	Stream	Perennial	Great Neck	ASC1		
Polygon	7311.53858	1607.48365	Hydrology	Stream	Perennial	Papermill	ASC1		
Polygon	6081.87418	1354.69108	Hydrology	Stream	Perennial	College	ASC1		
Polygon	218.6619	130.14473	Hydrology	Stream	Perennial	Half-Way	ASC1		
Polygon	28815.40234	6068.92526	Hydrology	Stream	Perennial	King's	ASC1		
Polygon	2174.89857	496.02777	Hydrology	Stream	Intermittent		ASC1		
Polygon	2092.0522	1389.99988	Hydrology	Stream	Intermittent		ASC1		
Polygon	2220.89577	293.69785	Hydrology	Lake/Pond		Wormley	ASC1		
Polygon	689.34251	102.2376	Hydrology	Lake/Pond		Jones Mill	ASC1		
Polygon	3007.46793	333.31923	Hydrology	Lake/Pond		Pitch and Tar	ASC1		
Polygon	758.70488	118.30515	Hydrology	Lake/Pond		Bracken's	ASC1		

Digitizing Documentation Form		2/26/98																																
Project Theme:		Digitizing Date(s):																																
Staff:																																		
Shapefile name (shp):	Map source name:																																	
Table file name (dbf):	Map source:																																	
PC system used:	Map date:																																	
Digitizer used:	Map revision date:																																	
Program used: ArcInfoNT ArcView3      IDRISI      Other	Map photography date:																																	
Data layers digitized:	Map photography scale:																																	
Is the data on an overlay to the basemap? If yes, is it -    mylar    paper    other	Map Projection:																																	
	Map material ( <i>circle one</i> ): Mylar    paper    other																																	
	Map type ( <i>circle one</i> ): ortho    planimetric    other																																	
	Map scale ( <i>circle one</i> ): 1:1200   1:2400   1:12000   1:24000   Other																																	
Circle the location of control used to reference map (use four points minimum)																																		
Indicate the RMS error in control point transformation at each point:																																		
1																																		
2																																		
3																																		
4																																		
Control point file name:																																		
Coordinate system used including projection, datum, spheroid:																																		
Planimetric X or Y Accuracy limiting rms error: <table border="1"> <thead> <tr> <th>Scale</th> <th>Feet</th> <th>Scale</th> <th>Meters</th> </tr> </thead> <tbody> <tr> <td>1:480</td> <td>.4</td> <td>1:500</td> <td>.125</td> </tr> <tr> <td>1:1200</td> <td>1.0</td> <td>1:2000</td> <td>.50</td> </tr> <tr> <td>1:2400</td> <td>2.0</td> <td>1:4000</td> <td>1.00</td> </tr> <tr> <td>1:4800</td> <td>4.0</td> <td>1:10000</td> <td>2.50</td> </tr> <tr> <td>1:9600</td> <td>8.0</td> <td></td> <td></td> </tr> <tr> <td>1:12000</td> <td>10.0</td> <td></td> <td></td> </tr> <tr> <td>1:24000</td> <td>16.7</td> <td></td> <td></td> </tr> </tbody> </table>			Scale	Feet	Scale	Meters	1:480	.4	1:500	.125	1:1200	1.0	1:2000	.50	1:2400	2.0	1:4000	1.00	1:4800	4.0	1:10000	2.50	1:9600	8.0			1:12000	10.0			1:24000	16.7		
Scale	Feet	Scale	Meters																															
1:480	.4	1:500	.125																															
1:1200	1.0	1:2000	.50																															
1:2400	2.0	1:4000	1.00																															
1:4800	4.0	1:10000	2.50																															
1:9600	8.0																																	
1:12000	10.0																																	
1:24000	16.7																																	
																																		
Remarks:																																		

Harddisk Subdirectory Set-up.7		Harddisk Subdirectory Set-up	
For AV3 projects to work without having to change paths, you should create a virtual D: drive with following subdirectory set-up. Individual themes are then placed under the appropriate subdirectory.			
D:\Esri Data \COLO Coverage <sup>4</sup> \COLO DLG <sup>5</sup> \COLO DRG <sup>6</sup> \COLO Projects \HIP \Maint \NRM \Ranger \Other \COLO Shapefiles \Access \Boundary \Cultural \Environment \ESS \Fire \Geodetic \Hydrology \Infrastructure \Land Cover \Monitoring \Regulatory \RTE \Vegetation \Temp <sup>7</sup>		E:\E_nrgis_ntfs \BW All 1_2400 Aerial Imagery \BW JI 1_1200 Aerial Imagery \Color All 1_2400 Aerial Imagery \Color JI 1_1200 Aerial Imagery \Color JI 1_7200 Aerial Imagery \DOQQ IF 1_40000 Aerial Imagery \MRLC ( <i>this is land cover from EPA</i> )	

<sup>4</sup> COLO Coverage's is for Arc Info Coverages only. COLO Shapefiles contains all of the park's Arc View shapefiles. Shapefiles include both the spatial (.shp) and attribute table databases (.dbf).

<sup>5</sup> USGS, digital line graph files of hydrography, hypsography, boundaries, roads

<sup>6</sup> USGS, digital raster graphics. This is a digital image of the standard 1:24000 7.5 maps from USGS.

<sup>7</sup> Under \TEMP you can create subdirectories for projects and themes in the development stage.

Subdirectory and Shapefile Names		
<i>Subdirectory</i>	<i>Shapefile Names<sup>8</sup></i>	<i>Themes</i>
<i>Access</i>	Access	Roads, parking area Trails, paths, sidewalks
<i>Boundary</i>	Bcolopk Bproject BNPS Bstate Bcounty Bcities	Colonial NHP Project area of interest for park GIS NPS units of the Northeast region States of the Northeast region Counties and cities of region Cities of the Northeast region
<i>Cultural</i>	Cultural	Archaeological sites, historic buildings, cemetery, earthworks, encampments, grids, historic roads, historic wells, historic plats
<i>Environmental</i>	Egeology Esoil Etopo	Surficial geology Soil map unit types Topography
<i>ESS</i>	ESS Eshore	Erosion and sedimentation, and stormwater problems Erosion of shoreline
<i>Monitoring<sup>9</sup></i>	Mfauna Mflora <sup>10</sup> MIPM <sup>11</sup> Mwater	Inventory/monitoring for fauna including, natives, exotics, species of concern and watchlisted. Inventory/monitoring for flora including natives, exotics, species of concern and watchlisted. Inventory/monitoring for integrated pest management. Includes invasive spp. Inventory and monitoring for surface and ground water, soil and sediment. <b><i>Inventory and monitoring includes transects, plots etc.</i></b>
<i>Fire</i>	Fire Firemap	Wildland fire history, national fire fuel load and national fire danger rating system Values at risk fire maps
<i>Geodetic</i>	Geodetic	Kilometer markers, UTM & latitude-longitude grid, geodetic controls (GPS and USGS), wildlife grid, aerial grid, DRG grid
<i>Hydrology</i>	Hydrology	shoreline, stream, ponds, lakes

<sup>8</sup> If there are separate polygon, line and/or point files of the same name, end the file name with PO, LN, PT, e.g. BcitiesPO, BcitiesPT.

<sup>9</sup> See also RTE for rare, threatened and endangered species.

<sup>10</sup> For flora includes watchlisted, species of interest, and champion trees.

<sup>11</sup> IPM, integrated pest management is where inventory and monitoring of structural, landscape and forest pest is placed, e.g., termites, gypsy moth, southern pine bark beetle, kudzu, Johnson grass, Canadian thistle, Tree of Heaven, Princess Tree, mice.

	Hfloodstorm Hpsprings Hydrounit HCBP Hhistoric	floodplains, storm surge areas springs and seeps USGS and Va. hydrological unit, sub-basin drainage's Chesapeake Bay watershed and sub-basins historic shoreline
Infrastructure	Infrast Iutility Isigns	buildings, structures, hydrants, tanks utilities and utility ROW's signs – traffic, informational, interpretative
Regulatory	Rzoning RCBP	Local zoning, tax parcels, park zoning Chesapeake Bay Regulatory area
Land Cover	Landcover	Adjacent land cover and classification.
RTE	RTESPP RTEZONE	Federal and Virginia rare, threatened and endangered species Associated conservation zones, habitat area
Vegetation	Vforest Vfield Vwetland Vsinkhole	Forest Fields, lawns, brush, bareground Wetlands per USFWS definition Sinkholes (ephemeral ponds)



<b>Minimum Attribute Fields for Tables</b> See data dictionary section below for type and size of field	
<i>Field Name</i>	<i>Purpose</i>
<b>Shape</b>	Identifies type of shapefile theme, e.g., polygon, polyline (arcs), point (nodes)
<b>ID</b>	Unique ID system, generated by Arc View
<b>Feature</b>	Identifies the general shapefile theme, e.g. Access, Boundary, Cultural, Environment, ESS, Fire, Geodetic, Hydrology, Infrastructure, Land Cover, Monitoring, Regulatory, RTE, Vegetation
<b>Feature.2</b>	More specific identification of Feature. For example Feature.2 could include for: Access – road, parking, walkway Cultural – earthwork, grid, building, foundation Vegetation – field, forest, wetland Infrastructure - building, ROW, utility, sign Hydrology - river, stream, pond, spring, floodplain
<b>Feature.3</b>	More specific than Feature.2. For example: Road – interstate, primary, local, tour, administrative, fire, private, sidewalk, trail Stream – perennial or intermittent Regulatory - RPA or RMA or zoning classification  <i>Further delineation of feature information should be defined using unique fields. For example for ACCESS additional fields might include:</i> <i>Ownership – public, park, military, private</i> <i>Surface – asphalt, concrete, dirt, gravel, shell,</i> <i>Width – 18'</i> <i>Lanes – 2</i> <i>Direction – 1, 2</i>
<b>Name</b>	Primary alphanumeric name used for auto-labeling i.e., stream name, river name, road name, building name, building number, and field number. If there is more than one way of identifying a feature you can create a new field called i.e. Name2 (e.g. Rt. 617), field name. You can also add NameX, where X designates a unique name that a park division uses to identify an area, e.g., NameH (HIP)
<b>Area</b>	Square meters (Arc View default)
<b>Perimeter</b>	Meters (Arc View default)
<b>Acres, Hectares,</b>	These fields are based on Avenue scripts that convert Area and Perimeter from meters.

### Minimum Attribute Fields for Tables

See data dictionary section below for type and size of field

<i>Field Name</i>	<i>Purpose</i>
<b><i>Kilometer, Miles, Feet</i></b>	
<b><i>Rev.Date</i></b>	Revision date of record
<b><i>Stype</i></b>	Quick reference on the source and quality of data
<b><i>Metadata</i></b>	Links to the Metadata file. Metadata is information on the data – how it was acquired, area it covers, quality, accuracy etc., and follows a national federal/NPS standard
<b><i>Image</i></b>	Links to an image, e.g., historical map, floorplan, photography, drawing
<b><i>Text</i></b>	Short description of feature, e.g., "The Colonial Parkway is a scenic 24 mile byway running along the James and York Rivers. It was started in xx and completed in xx).
<b><i>Video</i></b>	Links to video clip
<b><i>Views</i></b>	Links to different views within Arc View project, e.g., change from Parkwide to Green Spring only

<b>Standard Feature, Feature2, Feature3, Name<sup>12</sup></b>			
<i>Feature</i>	<i>Feature2</i>	<i>Feature3<sup>13</sup></i>	<i>Name</i>
<b><i>Access</i></b>	Road  Parking Walkway Driveway	interstate, primary, local, tour fire, administrative, private lot, turnout, overlook sidewalk, trail, footbridge --	Colonial Parkway, YVC, Glebe Gut, Cook Rd, Rt. 17, I-64, West Tour Rd., Inner Loop Road Route numbers should be placed under Name.2 unless the route number is the commonly used name, e.g. Rt.17, I-64
<b><i>Boundary</i></b>	Park, NPS, State, County, City, Private	fee, scenic, life, easement	Colonial NHP, Richmond NBP, Shenandoah NP14, Virginia, James City County, Newport News Park, Colonial Williamsburg
<b><i>Cultural</i></b>	Earthworks, Well, Fence, Foundation, Road, Grid, Dam, Archaeological Site, Building, Farm, Fence, Cemetery, Burial Site, Va. SHPO Site, Encampments, Troop Movement	original, restoration, excavation, reconstruction, brick cased	Redoubt 9, Moore House, Green Spring manor, Windmill Point, Grand French Battery
<b><i>Environmental</i></b>	Geology, Soil, Topography	index, intermediate	Geology unit type, soil map unit type, 1, 2, 5 or 10 ft.
<b><i>ESS</i></b>	Gully, Rill, Sheet, Stormwater	--	ID code
<b><i>Fire</i></b>	History, NFDRS, NFFL	fire rating code 1, 2, 5, 10 (foot)	Fire number (YR-##), rating --
<b><i>Geodetic</i></b>	UTM, LL, Wildlife Grid, Aerial Grid, DRG Grid, Starr Node, KM, GPS, USGS		Grid ID #, kilometer marker #, monument #, benchmark ID, starr node #

<sup>12</sup> This is not a complete list. Please provide additions to the GIS coordinator so that this table and the data dictionary can be kept up to date.

<sup>13</sup> Feature3 – use if needed, otherwise leave blank

<b>Standard Feature, Feature2, Feature3, Name<sup>12</sup></b>			
<i>Feature</i>	<i>Feature2</i>	<i>Feature3<sup>13</sup></i>	<i>Name</i>
<b>Hydrology</b>	River, Stream, Lake, Pond, Spring, Seep, Floodplain, Storm Surge, Watershed, Sub-Basin Drainage	perennial, intermittent, 100 year	James River, Beaver Dam Creek, Wormley Pond, Chesapeake Bay Watershed
<b>Infrastructure</b>	Electrical, Water, Sewer, Telephone, CTV, Natural Gas, Heating, Cellular, Petroleum, Building, Signage, Bridge, Tunnel, Dam, Sign, Drainageways, Wall, Fence, Trash Container.	Distribution line, pedestal, UGT, AGT, antenna, tower, hydrant, transformer, drinking well, culvert, swale, inlet, outlet, outlet protection, check dam, duck blind, restroom, drinking fountain. For buildings use administrative, residential, maintenance, commercial, industrial, visitor center. For signs use traffic, informational, interpretative	CRO, ## mph, YVC, Hogge House
<b>Land cover</b>	Residential, Commercial, Industrial, Military, Public Use, Forested, Open, Wetland	--	Kingspoint, Bowditch Ford, Ball Corp., NWS, Colonial Williamsburg, Newport News Park, Newport News Waterworks
<b>Monitoring</b>	Fauna, Flora, IPM, Surface Water, Ground Water, Soil and Sediment	plot, transect, observation, special concern, watchlisted	Spp. common name, monitoring alphanumeric location code, neotropical bird survey
<b>Regulatory</b>	Zoning, Tax Parcel, Chesapeake Bay	--	tax parcel number, zoning classification, RPA, RMA, park zoning classification
<b>RTE</b>	Species, Conservation Zones	--	Spp. Common name; groundwater, surface water, habitat, no entry, stream conservation zone

Standard Feature, Feature2, Feature3, Name <sup>12</sup>			
Feature	Feature2	Feature3 <sup>13</sup>	Name
<b>Vegetation</b>	Forest, Tree, Field, Lawn, Wetland, Brush, Sinkhole, Bareground	--	Field #, USFWS full wetland definition (POF1), vegetation classification

GIS Source Type (Style) Table			REV: 12/28/98
Source Code Legend			
ASC	Air Survey Corporation		
AV	Arc View 3		
CO	USDI, NPS, Colonial NHP		
DLG	USGS, DLG		
JCC	James City County		
NC	North Carolina State University, Center for Earth Observation, GIS Program		
NWI	USFWS, NWI (national wetland inventory)		
SCS	USDA, NRCS, Richmond, VA.		
VA	State of Virginia, ECOMAP and Geological Survey		
VI	Virginia Institute of Marine Science, CMAP		
YC	York County		
USG	USGS		
WAS	NPS, WASO, WRD		
Source Type	Data Scale	Comments	
ASC1	1:2400	Produced by Air Survey Corporation for NPS from 1997 georeferenced aerial photography	
AV1	1:?	From Arc View 3 Map data CDROM, volume 1	

CO1	For reference purpose only	ROW's digitized on-screen based on permit and deed information. Utility ROW's registered to centerline of roads whenever appropriate. ROW's will be moved to correct position referenced to road shoulders information obtained from JCC and YCC. For reference purposes only.
CO2	For reference purpose only	Some fields were too small to interpret from the 70mm aerial photography, and were digitized on-screen to approximate location and size for reference purposes only. For reference purposes only.
CO3	For reference purpose only	Turnouts based on engineering park maps and field review.
CO4	For reference purpose only	Vegetation monitoring for Canadian thistle, Johnson grass and Yorktown onion based on field review and approximation. Distribution based on visual measurements. For reference purposes only.
CO5	1:24000	Trails inserted according to 1:24000 topography and field review.
CO6	For reference purpose only	Fire history information based on approximate center point of fire as noted in wildfire reports. For references purposes only.
CO7	For reference purpose only	Fire fuel vegetation rating is an interpretation of the 1990 VEG_AL.agf file based on national wildfire manual rating of vegetation types.
CO8	For reference purpose only	Jurisdiction is an interpretation of hand drawn map
CO9	1"=200'	Confederate rifle pit on Jamestown Island at Frigetts Landing. Based on map J-46150. Registered to archaeological grid (see NC2).
CO10	For reference purpose only	100-meter grid based on VIMS GPS point N95E105. Created for J.I. archaeological assessment mapping
CO11	For reference purpose only	Project area drawn on-screen to include sub-basin watersheds and opposite shorelines. From 1:24000 topo maps.
CO12	1:24000	From combining NC12 and VI9
CO13	1:24000	From combining NC12, VI9, VI11, CO12
CO14	See comments	Digitized from Col. Desandrouins 1781 paper map copy of the Green Spring plantation and environs. Digitized map registered to 1:24000 1982 DLG's.
CO15	See comments	Digitized from 1955 paper map. Archaeological investigation of Gov. Berkeley's Green Spring manor by NPS, Caywood. Map brought in using two GPS points and then registered to CO16.
CO16	1:2400	VARGIS, natural color 1 foot, order one
CO17	1:2400	VARGIS, black and white, 1/2 ft resolution, order one
DLG1	1:24000	USGS, DLG, 1972
DLG2	1:100000	USGS, DLG, 1972
DLG3	1:250000	USGS, DLG, 1972

DLG4	1:24000	USGS, DLG, 1983
JCC1	1:24000	James City County
JCC2	1:200	James City County, registered to order one GPS monuments
NC1	1:24000	Registered to USGS 7.5 topos, 1963-80 (see NC12)
NC2	1"=40'	Based on Cotters Jamestown Island Archaeological Base Map created on Island wide archeological grid. This grid was geo-referenced in 11/93 by GPS under contract to VIMS, CMAP and then moved from a user defined to UTM grid in ATLAS*GIS.
NC2	1"=20'	Travis graveyard archaeological excavations and contours. Based on half-foot intervals. Registered to archaeological grid
NC2	1"=100'	Confederate forts of Jamestown Island consolidated from original maps (J-46422, 46417). Registered to archaeological grid.
NC3	1":800'	17th century historic sites in Yorktown based on 1970's report by Hatch. Sites fitted to USGS 7.5 topo map. For reference purposes only. COLO map Y-66651
NC4	1"=40'	Jamestown Island historic contour map based on half-foot contour intervals. Original map produced from field observations using plane table and survey instruments. Covers old and new town area e.g. APVA and NPS archaeological base map.
NC5	1:101cm=.1m	Photogrammetry of STR107, 108, 109 at Glasshouse. Photos transferred to mylar base and then digitized into user defined projection. Cadastral survey quality GPS work will need to be completed to transfer information into geo-referenced UTM.
NC8	1"=20'	Jamestown Glasshouse excavations. Registered to archaeological grid (see NC2).
NC9	1"=200'	Land holders plots, position of palisaded fort and 17th century shoreline. Based on Yong's map, J-46163.
NC10	1:125000	Selected revolutionary earthworks found on 1931 (VACDC1931) map of Yorktown battlefield, backside, of the 1:25000 combined topographic map.
NC11	For reference purpose only	Based on COLO's land status maps prepared to scale by Phil SO Land Resources Division. Maps are at different scales and accuracy. Calculations of parkland area based on digitizing of land status maps are within 2% of official acreage. But digitized road corridors are to large e.g. Rt. 17 and Colonial Parkway.
NC12	1:24000	Registered to USGS 7.5 orthophotoquads. Interpreted from 1989 1:12000 true color aerial transparencies (see NC1).
NC13	1:24000	Grids created using ATLAS*GIS. Grids include UTM, LL.
NC14	1:24000	GRIDWILD created in ATLAS*GIS using SCRIPT GRIDCELL program. Each cell equals 1/3 sq. mile
NC15	see comment	STARRNODE is a motor vehicle accident reporting system based on road intersections.
NC16	1:24000	RTE species and critical habitats based on maps provided by Virginia Department of Natural Heritage. Critical habitats follow topography and shoreline found on USGS 7.5 topo maps. RTE's registered to 7.5

		topo maps, and includes either approximate location of individual species or center point of area RTE is found in. This data older than NC20.
NC17	See comment	Invalid, superceded by NC10.
NC18	1"=750'	Based on 1926 Coastal Artillery School survey of Civil War earthworks of Yorktown. COLO map Y-66976
NC19	For reference purpose only	Combines NC11 and VI1
NC20	1:24,000	USGS 7.5 topo maps, 1983-84. Used for RTE IV Conservation Planning Zones/Plan.
NC21	1:800'	NPS, 1937, Vegetation Cover Type Map of Yorktown field survey.
NC22	For reference purposes only	Information from Virginia State Historic Preservation Officer. Registered to 1:24000 USGS topo, 1972 map.. Location based on UTM center point. Polygon is an estimate
NC23	1"=800'	NPS, 1935 Vegetation Cover Type Map survey
NWI1	1:24000	USFWS, national wetland inventory, 1994/95
SCS1	1:24000	Soil areas registered to USGS 7.5 topo map, 1972, based on recompilation of original SCS soil survey.
SCS2	1:24000	Registered to USGS 7.5 topo map, 1972. Drainage's and intermittent streams follow contours based on SCS interpretation.
SHPO	For reference purpose only	Information from Virginia State Historic Preservation Office. Registered to 1:24,000 USGS topo map. For reference purposes only. Location based on UTM center point. Polygon is an estimate.
VA1	1:250000	Geological Maps prepared from Va. State Report by Johnson, Berquist
VA2	1:24000	Registered to USGS 7.5 topo. Based on fieldwork by Dr. R. Berquist, Va. Geological Survey.
VI1	1:4000	1990 shoreline used also for part of park boundary along rivers. Positional accuracy based on GPS near order one. Based on high mean tide. Shoreline interpreted from VDOT 9x9 black and white photography enlarged to 28"x28".
VI2	1:5000	Va. Marine Resources Shoreline survey in 198? at low mean tide.
VI3	1:24000	Based on USGS 7.5 topo maps, 1972.
VI4	1:25000	Based on USGS combined 7.5 maps of park
VI5	1:24000	Based on USGS 7.5 topo maps. FIRM floodplain maps transferred by hand to mylar 7.5 topo maps based on topographic contours.
VI6	1:24000	Based on USGS 7.5 maps, 1972. Buffer zones created based on different localities Chesapeake Bay RPA and RMA regulations.
VI7	1:24000	Based on USGS 7.5 topo maps, 1972. Original Johnson, Berquist surface geology maps interpreted and information transferred to these maps and digitized.
VI8	1:24000	Localities adjacent land use zoning maps transferred to USGS 7.5 topo maps.



VI9	1:24000	Tidal Marsh Inventory conducted by VIMS. Ground verified.
VI10	1:12000	GPS near order one accuracy
VI11	1:24000	Field delineated (general detail) as part of WRMP
VI12	1:4000	GPS by VIMS, CMAP 1 foot or better horizontal accuracy, 1993, 1994
YC1	1:1200	Registered to order one GPS monuments
YC2	1:24000	From other sources, e.g., NWI, FEMA
WAS1	For reference purpose only	Provided by WASO-WRD-GIS. Mostly at 1:250,000.
WAS2	For reference purpose only	Provided by WASO-WRD-GIS, see Name2 field
WAS3	See comments	WASO Cultural GPS crew, 1996, 1meter accuracy
WAS4	See comments	WASO Cultural GPS crew, 1997, 1 meter accuracy

# Blank GIS Data Dictionary Form

*Shapefile name (shp) –*

*Attribute table name (dbf) –*

*All data UTM 18, NAD 27 unless stated otherwise*

[illegible]

.1 MASTER FILE DESCRIPTION

<b>Master GIS Feature Taxonomy And Map Presentation</b> Based on HP750C+ color chart and Artist.avp	
<i>Shapefile</i>	<i>Color(s), HP750C+ color numbers<sup>15</sup></i>
<b><i>Access</i></b>	Black, red, orange, gray
<b><i>Boundary</i></b>	Black, green (park)
<b><i>Cultural</i></b>	Purple, violet, red, orange, yellow, brown
<b><i>Environmental</i></b>	Brown
<b><i>ESS</i></b>	Red
<b><i>Fauna</i></b>	Brown
<b><i>Fire</i></b>	Red
<b><i>Flora</i></b>	Green
<b><i>Geodetic</i></b>	Black, yellow
<b><i>Hydrology</i></b>	Blue, black
<b><i>Infrastructure</i></b>	Black, red, blue, green orange, brown, yellow
<b><i>Land Cover</i></b>	Orange, red, violet, yellow, green
<b><i>Regulatory</i></b>	Violet, black, orange
<b><i>RTE</i></b>	Violet
<b><i>Vegetation</i></b>	green, brown, yellow, aqua

**Data Dictionary (in development and updating)**

<sup>15</sup> The color palettes that come with Arc View have many different shades of green, blue, orange, yellow, red, brown, gray etc. The color table designations are merely designates the primary color. The primary color is merely a reference point to use in choosing the shade of greens, blue, reds, browns etc. you want to use in your map. If you are using an HP750C+ plotter you should use the customized color palette Artist.avp. This palette will match screen colors to plotter output.

<b>GIS-GPS Project Request Form</b> National Park Service Colonial National Historical Park PO Box 210, Yorktown, VA 23690		REV: 12/19/97
<b><i>Before completing form please call with any questions, clarifications needed</i></b> Refer questions to Dave Frederick, 890.2267 or Chuck Rafkind, 898.8677. <a href="mailto:Dave.Frederick@nps.gov">Dave.Frederick@nps.gov</a> or <a href="mailto:Charles.Rafkind@nps.gov">Charles.Rafkind@nps.gov</a> .		
<b>Submit request form by fax (757.898.6025) or email to above persons</b> Requests may require funding to cover cost of materials and time.		
<b>Requested by:</b>	<b>Division:</b> RMVP__ HIP__ Maint__ Adm.__ Supt.__ Other__ (explain)	
<b>Date Submitted:</b>	<b>Date Needed by:</b>	
<b>Organization (if not COLO):</b>		
<b>Address (if not COLO):</b>		
<b>email address (if not COLO):</b>		
<b>Phone Number (if not COLO):</b>	<b>Fax Number (if not COLO):</b>	
How do you want this map, digital data or project? <i>(check applicable items below)</i>		
What do you want? Digital Data__ Digital Map__ Hardcopy Map__ Hardcopy of aerial photography__ GPS field work__ New Data Development__ Analysis (distance, area, etc.) __ Technical Assistance (design of database, advise etc.) __ Other (explain) __		
Describe the purpose of the project. Be specific. What is the reason for the map, data, new data, GPS, or analysis? Will it be used to create an exhibit, folder, slide/Powerpoint program, report, public meeting, other?		
What do you want to be prominent on the map (which themes or subthemes from page 2)? In what priority? <i>Use page two to check which themes and subthemes you need.</i>		
<b>Would you like a locator map insert, e.g., showing COLO within Virginia, or within the Peninsula?</b> No__ COLO w/in Va.__ COLO w/in Peninsula__ Other__		
<b>Map Size:</b> A (8.5x11)__ B (11x17)__ C (17x22)__ D (22x34)__ E (34x44)__		
<b>Map Scale:</b> (please specify, remember scale can't be better than the original data, see theme section below) 1:____ (USGS quads are 1:24,000) <i>If no scale maps will be produced to fill map size</i>		
<b>Map media:</b> Bond (draft)__ Archival, heavy coated (final)__ Exhibit quality semi-gloss photo__ Transparency__		
<b>Digital data – how do you want the data delivered?</b> 3.5 floppy diskette__ T1000 travan tape__ HP DDS-2 DAT 4 GB tape__ CD-ROM__ Other, provided by requester__		

<b>What themes and scale do you want on the map or in digital format?</b>	
Theme/subtheme/scale – <b><i>note that under each theme there are sub-themes (italic). In completing this form remember to circle those subthemes you want.</i></b> <i>Available in Arc View 3 shapefile format, UTM18, NAD27</i>	<b>Check here</b> (check if wanted.)
<b>Aerial photography prints:</b> <i>1:40000, park and region. infrared, 3 ft resolution</i> <i>1:7200 Jamestown Island, natural color, 1 ft resolution</i> <i>1:2400 York County, black and white ½ ft resolution</i> <i>1:2400 James City County and City of Williamsburg natural color, 1 ft resolution</i> <i>1:1200 Jamestown Island, natural color, 1 ft resolution</i> <i>The 1:40000 infrared color photography is available in digital or hardcopy format. The 1:7200 natural color photography for Jamestown Island is available in digital or hardcopy. The 1:2400 photography is only available as hardcopy.</i>	
<b>Boundary:</b> <i>park- all or fee, easements, scenic; regional states, local county and city jurisdictions, NPS areas of the Northeast Region, cities of the Northeast Region, 1:2400-1:24000</i>	
<b>Cultural, earthworks, archaeological digs:</b> <i>cultural sites - 17, 18, 19, 20<sup>th</sup> century; historic vegetation [Jamestown Island, 1606-99 and 1935, 1990] or [Yorktown, 1782, 1940, 1990], archaeological investigations for Jamestown and Glasshouse, State Historic Preservation Officer cultural sites, Hatch report for Yorktown, 1:24000</i>	
<b>Digital raster graphics</b> of USGS 7.5 topo maps 1:24000	
<b>Exotic species</b> location-Johnson grass, bamboo, phragmitis, 1:24000 not available yet	
<b>Fire history</b> -map, attributes	
<b>Geodetic Monumenting</b> -USGS benchmarks, GPS order one or near order one, Lat/Lon or UTM grid, wildlife grid, kilometer markers for parkway and tour roads, 1:24000	
<b>Geology</b> , surficial 1:24000 (not available yet) or 1:250,000	
<b>Groundwater</b> - monitoring wells or analysis	
<b>Hydrology</b> -river shorelines, streams, ponds and lakes, watersheds, sub-basin watersheds, floodplains, storm surge, springs and seeps 1:24000	
<b>Infrastructure</b> – building footprints, utility rights-of-way and types 1:2400-1:24000	
<b>Land cover</b> , regional - commercial, residential, mixed use, military, conservation, forest, agricultural, 1:24000	
<b>Rare, threatened, and endangered species and conservation zones</b> 1:24000	
<b>Roads</b> -park, administrative, local, primary, interstates of NER, some roads center line only, some with edge of pavement, 1:2400 to 1:24000	
<b>Soil map units</b> , 1:24000	
<b>Surface water locations, analysis</b> , 1:24000	
<b>Topography</b> - 10 ft parkwide, 2 ft York County and Jamestown Island, 1 ft Jamestown Island, 5 ft James City County 1:2400-1:24000	
<b>Trails</b> 1:24000	
<b>Vegetation</b> – all, forest, tree, brush, field, lawn, wetlands, mowing regime, 1:24000	
Other, explain:	
Below to be completed by NRM-GIS	
Start-up – Requester Contacted (initial and date):	
Date Completed:	Completed by:
No. of hours: Cost:	Cost material and supplies: What was used:

## **GIS Standard Contract Specifications**

### Colonial National Historical Park

1. The Park will receive a complete integrated, geo-referenced spatial/attribute GIS database. All information will be compatible with the park's GIS (Arc Info NT, Arc View or higher. All data will be georeferenced to UTM18, NAD27, meters, spheroid Clarke 1866.
2. All final maps are to be in AV3 project layout format.
3. Before starting any new GIS spatial/attribute database theme the contractor/cooperator will hold a meeting(s) with the park staff including the GIS coordinator, to discuss and design the initial database. Attribute tables will at a minimum meet the park's SOP for GIS Table Attribute Guidelines. Additional guidelines, coding system etc. will be discussed and developed during the meetings. The final design will be in writing and approved by the park.
4. Based on a small sub-sample, approximately 10%, of the data will be entered into the GIS and tested by the cooperator/contractor and the park.
5. Once #4 has been completed, and approval received from the park, the database can be completed.
6. The cooperator/contractor will demonstrate that each GIS database works properly before the Park will accept. Also, the Park before acceptance must approve final map design.
7. Metadata files are required and can be created in Word95/97 or Metamaker II software. The Park will provide guidance on the minimum fields to be completed and standard language to be used.
8. GIS draft databases and Metadata should be delivered incrementally. The contractor or cooperator should not wait until all, or most of the GIS database themes are completed before delivering the final drafts for checking and approval.
9. It is the contractor/cooperators responsibility to correct all items pointed out by the Park under items 4, 6, 7, and 8.
10. The final GIS databases files will be delivered on CD's, two copies, as either Arc Info coverage or Arc View3 format. The CD's will also contain the final Metadata files.
11. The contracting officer technical representative must first approve distribution of the draft or final digital GIS database themes or maps by the contractor/cooperator to any other person than the park or via the World Wide Web.